

WHAT IS CLAIMED IS:

1. A centrifuging settling tube comprising:
a bottomed tube closed at a distal end thereof and open at a proximal end thereof;
5 an inner tube constituted of a tube body that is insertable into said bottomed tube and open at distal end and proximal ends thereof and of a ring-like elastic member provided on an outer surface of said distal portion of said tube body;
a sealing member capable of sealing a rear end opening of said inner tube;
10 and
a fixing member for removably fixing said inner tube to said bottomed tube,
wherein said distal end of the inner tube is spaced at a predetermined interval from a distal end of said bottomed tube, with the inner tube inserted into
15 said bottomed tube;
at least during centrifugal separation, said ring-like elastic member is capable of liquid-tightly holding a space between an inner surface of said bottomed tube and the outer surface of said distal portion of said tube body,
said settling tube further comprising a collecting portion formed in a space
20 formed by a surface of a distal end of said ring-like elastic member, an inner surface of a distal portion of said bottomed tube, and an outer surface of a distal portion of said inner tube.
2. A centrifuging settling tube according to claim 1, wherein said distal portion of said bottomed tube decreases in a diameter thereof toward said
25 distal end thereof.
3. A centrifuging settling tube according to claim 2, wherein said ring-like elastic member is capable of closely contacting an inner surface of said distal portion of said bottomed tube that decreases in said diameter thereof toward said distal end thereof.
- 30 4. A centrifuging settling tube according to any one of claims 1

through 3, wherein said distal portion of said tube body decreases in a diameter thereof toward said distal end thereof.

5 5. A centrifuging settling tube according to any one of claims 1 through 4, wherein said ring-like elastic member decreases in a diameter thereof toward said distal end thereof.

 6. A centrifuging settling tube according to any one of claims 1 through 5, wherein said fixing member has an engaging portion that engages said inner tube when said fixing member is removed from said bottomed tube; and when said fixing member is separated from said bottomed tube, said inner tube can
10 be taken out of said bottomed tube.

 7. A centrifuging settling tube according to any one of claims 1 through 6, wherein a proximal portion of said bottomed tube has a first screwing portion; and said fixing member has a second screwing portion capable of screwing said first screwing portion.

15 8. A centrifuging settling tube according to any one of claims 1 through 6, wherein said proximal portion of said bottomed tube has a first engaging portion; and said fixing member has a second engaging portion capable of engaging said first engaging portion.

 9. A centrifuging settling tube according to any one of claims 1
20 through 8, wherein a proximal portion of said sealing member and that of said inner tube have an engaging means respectively for preventing said sealing member from being removed from said proximal portion of said inner tube.

 10. A centrifuging settling tube, according to any one of claims 1 through 9, for removing viruses or bacteria from a liquid containing organic cells.

25 11. A centrifuging settling tube, according to any one of claims 1 through 10, for removing viruses or bacteria from a liquid containing organic cells,

 wherein by centrifuging said liquid, said centrifugal settling tube keeps said viruses or said bacteria inside said inner tube without flowing said viruses or said bacteria into said collecting portion of said bottomed tube and is capable of
30 collecting said organic cells inside said collecting portion of said bottomed tube.

12. A centrifuging settling tube according to any one of claims 1 through 11, wherein a liquid is filled in said distal portion of said bottomed tube and said distal portion of said inner tube.

13. A centrifuging settling tube according to any one of claims 1 through 12, wherein said liquid contains a medium; and a concentration of said medium is high in said distal portion of said bottomed tube and low in said inner tube.

14. A centrifuging settling tube according to any one of claims 1 through 13, wherein said organic cells are spermatozoa or ova.

15. A centrifuging settling tube according to any one of claims 1 through 14, wherein said viruses or bacteria include one or more of herpes virus, papilloma virus, molluscum contagiosum virus, hepatitis virus, human acquired immunodeficiency virus, cytomegalovirus, EB virus, Chlamydia, Chlamydia trachomatis, gonococcus, treponema pallidum, chancroid bacterium, and Candida.

16. A centrifuging settling tube according to any one of claims 1 through 15, wherein said sealing member is fixed to said fixing member or said sealing member is formed integrally with said fixing member.

17. An organic cell-collection tube for removing viruses or bacteria from a liquid containing organic cells and collecting said organic cells, comprising:
a tube having a path penetrating therethrough from one to other ends thereof;

a sealing member layer, accommodated in said tube, which contacts a moisture content and is thereby capable of substantially forming a liquid-tight state;

a first aqueous liquid layer which is filled in at a position nearer to one end of said tube than said sealing member layer and spaced at a predetermined interval from said sealing member layer;

a first air layer provided between said first aqueous liquid layer and said sealing member layer;

a second aqueous liquid layer filled in at a position spaced at a predetermined interval from said first aqueous liquid layer;

a second air layer provided between said second aqueous liquid layer and said first aqueous liquid layer; and

a viscous substance-containing liquid layer which is provided in contact with said second aqueous liquid layer and captures viruses or bacteria disposed at one end portion of said tube.

18. An organic cell collection tube, according to claim 17, having a liquid suction appliance connection connector at other end thereof.

19. An organic cell collection tube according to claim 17, wherein said other end thereof is formed as a portion which can be connected to a liquid suction appliance.

20. An organic cell collection tube, according to claim 17, having a liquid suction appliance connected to said other end thereof directly or through said connector.

21. An organic cell collection tube according to any one of claims 17 through 20, wherein said sealing member layer which contacts said moisture content and is capable of substantially forming a liquid-tight state is made of an air-permeable member containing a water-swollen substance.

22. An organic cell collection tube according to any one of claims 17 through 21, wherein a viscous substance contained in said viscous substance-containing liquid layer is a water-soluble viscous polymeric compound.

23. An organic cell collection tube according to any one of claims 17 through 21, wherein said viscous substance contained in said viscous substance-containing liquid layer is water-soluble viscous polysaccharides.

24. An organic cell collection tube according to any one of claims 17 through 21, wherein said viscous substance contained in said viscous substance-containing liquid layer is at least one selected from among a group of glycosamino glycan, glycuronane, methyl cellulose, dextran, pectin, starch, gum Arabic, and guar gum.

25. An organic cell collection tube according to claim 24, wherein said glycosamino glycan is at least one selected from among a group of chondroitin

sulfate, chondroitin, hyaluronic acid, dermatan sulfate, heparin, heparan sulfate, keratan sulfate, kerato-poly sulfate or salts thereof or derivatives thereof.

26. An organic cell collection tube according to any one of claims 17 through 25, wherein said organic cells are spermatozoa or ova.

5 27. An organic cell collection tube according to any one of claims 17 through 26, wherein said viruses or bacteria include one or more of herpes virus, papilloma virus, molluscum contagiosum virus, hepatitis virus, human acquired immunodeficiency virus, cytomegalovirus, EB virus, Chlamydia, Chlamydia trachomatis, gonococcus, treponema pallidum, chancroid bacterium, and Candida.

10 28. An organic cell collection tube according to any one of claims 17 through 27, wherein said first aqueous liquid layer contains female hormones.

29. An organic cell collection tube, according to any one of claims 17 through 27, having a female hormone-containing layer provided between said first aqueous liquid layer and said first air layer.

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